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How Changes in Economic Assumptions Can Affect Budget Projections

The federal budget is sensitive to economic conditions. Revenues depend on taxable income—including wages and salaries, other nonwage income, and corporate profits—which generally moves in step with overall economic activity. Spending for the benefits of many entitlement programs is pegged to inflation either directly (as in Social Security) or indirectly (as in Medicaid). In addition, the Treasury regularly refinances portions of the government's debt at market rates, so federal spending for interest on that debt is directly tied to such market rates.

To illustrate how assumptions about the economy can affect federal budget projections, the Congressional Budget Office (CBO) uses key economic variables to construct “rules of thumb.” Those rules provide rough orders of magnitude for gauging how changes in individual economic variables, taken in isolation, will affect the budget's totals.

The variables that figure in this illustration are real (inflation-adjusted) growth, interest rates, and inflation. For real growth, CBO's rule of thumb shows the effects of a rate that is 0.1 percentage point lower each year, beginning in January 2004, than the assumed rate of growth underlying the agency's baseline projections (outlined in Chapter 1). The rules of thumb for interest rates and inflation assume an increase of 1 percentage point over the rates in the baseline, also starting in January 2004.

Each rule of thumb is roughly symmetrical. Thus, the effects of higher growth, lower interest rates, or lower inflation would have about the same magnitude as the effects shown in this appendix, but with the opposite sign.

The calculations that appear in this appendix are merely illustrative of the impact that such changes can have.

CBO chooses the variations of 0.1 percentage point or 1 percentage point, respectively, for the sake of simplicity alone. Extrapolating from small, incremental “rule-of-thumb” calculations to much larger changes would be inadvisable, because the magnitude of the effect of a larger change is not necessarily a multiple of a smaller change.

Lower Real Growth

Strong economic growth improves the federal budget's bottom line, and weak economic growth worsens it. The first rule of thumb outlines the budgetary impact of economic growth that is slightly weaker than CBO's baseline assumes. CBO's rule of thumb for GDP uses 0.1 percentage point, rather than the full percentage point used in the interest rate and inflation rules. Specifically, the rule illustrates the effects of real gross domestic product (GDP) growth rates that are lower by 0.1 percentage point every year from January 2004 through the end of fiscal year 2014. Those effects differ from the effects of a cyclical change, such as a recession, which are much shorter-term in nature and usually larger in magnitude.

The baseline reflects an assumption that real GDP growth is 4.8 percent in calendar year 2004, 4.2 percent in 2005, and averages 2.7 percent from 2006 to 2014 (*see Chapter 2*). Subtracting 0.1 percentage point from that rate each year means that the level of GDP would fall roughly 1 percent below the level in CBO's baseline by 2014.

A lower rate of growth for GDP would have a number of budgetary implications. For example, it would suggest lower growth in taxable income, leading to losses in revenues that would mount from \$1 billion in 2004 to \$42

billion in 2014 (*see Table B-1*). Revenue losses would total \$201 billion over the 2005-2014 period, or 0.7 percent of the projected revenues over that period.

Lower revenues would mean that the federal government would borrow more and incur greater interest costs. The costs to service that debt would be minimally higher during the first few years of the projection period, but in later years those costs would gradually rise, reaching \$11 billion in 2014. Debt-service costs would total \$37 billion over the 2005-2014 period, but their impact would be blunted slightly by outlay savings of \$2 billion, for a resulting cumulative increase of \$35 billion. All told, growth in real GDP that was 0.1 percentage point a year lower than the rate assumed in CBO's baseline would boost deficits by a total of \$236 billion over the 2005-2014 period.

Higher Interest Rates

The second rule of thumb illustrates the sensitivity of the budget to changes in interest rates, which affect the flow of interest to and from the federal government. When the budget is in deficit, the Treasury must borrow additional funds from the public to cover any shortfall. When the budget is in surplus, the Treasury uses some of its income to reduce debt held by the public. In either case, the Treasury refinances some debt at market interest rates.

Under the assumption that interest rates are 1 percentage point higher than in the baseline for all maturities—every year—and that all other economic variables are unchanged, interest costs would be approximately \$11 billion higher in 2004 (*see Table B-1*). That initial jump in interest costs would be fueled largely by the extra costs of refinancing the government's Treasury bills (securities with maturities of six months or less), which make up about 27 percent of its marketable debt. Roughly \$900 billion of Treasury bills is currently outstanding; all of those bills mature within the next six months. The bulk of marketable debt, however, consists of medium-term notes and long-term bonds, which were issued with initial maturities of two to 30 years. As those securities mature, they will be replaced with new securities (the Treasury currently issues two-, three-, five-, and 10-year notes). Thus, the budgetary effects mount; in 2014, the impact of interest rates that are 1 percentage point higher than in the baseline would be \$54 billion.

Under this scenario, the Treasury would have to raise additional cash (above the levels assumed in the baseline) to finance the larger outlays for net interest. Such debt-service costs would climb to \$32 billion by 2014 and total \$142 billion over the 2005-2014 period. All told, if interest rates were a full percentage point higher than the rate assumed in CBO's baseline, interest payments (including the additional debt-service costs) would surpass baseline levels by \$592 billion between 2005 and 2014.

That cumulative amount is nearly 60 percent larger than the results of an identical calculation presented in last year's report.¹ Given the deficits and surpluses projected in January 2003, CBO calculated that interest rates 1 percentage point above baseline levels would boost net interest by a total of \$374 billion. At that time, however, CBO was projecting a cumulative surplus of \$1.3 trillion—in contrast to CBO's current projected cumulative deficit of \$1.9 trillion—for the 10-year baseline period. That reversal leads to anticipated levels of borrowing that are significantly higher. Also contributing to the greater effect on interest costs is a level of outstanding debt held by the public that is about \$400 billion higher than it was last January.

Higher Inflation

The third rule of thumb shows the budgetary impact of inflation that is 1 percentage point higher than the level assumed in the baseline. The effects of inflation on federal revenues and outlays tend to offset each other, although the impact on revenues is somewhat larger. On the one hand, higher inflation and its effects on wages and other income leads to greater revenues. On the other hand, higher inflation pushes up spending for many benefit programs and drives growth in projections of discretionary spending. In deriving this rule of thumb, CBO also assumes that nominal interest rates rise in step with inflation, thus increasing the cost of financing the government's debt.

An annual increase of 1 percentage point in projected inflation in every year of the baseline period would boost revenues by more than \$2.0 trillion, or about 7 percent,

1. See Congressional Budget Office, *The Budget and Economic Outlook: Fiscal Years 2004-2013* (January 2003), Appendix C.

Table B-1.**Estimated Effects of Selected Economic Changes on CBO's Baseline Budget Projections**

(Billions of dollars)

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Total, 2005- 2009 | Total, 2005- 2014 |
|-----------------------------------------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------------------|-------------------------|
| Growth Rate of Real GDP Is 0.1 Percentage Point Lower per Year | | | | | | | | | | | | | |
| Change in Revenues | -1 | -3 | -6 | -9 | -12 | -16 | -20 | -25 | -31 | -36 | -42 | -47 | -201 |
| Change in Outlays | | | | | | | | | | | | | |
| Net interest (Debt service) | * | * | * | 1 | 1 | 2 | 3 | 4 | 6 | 8 | 11 | 5 | 37 |
| Mandatory spending | * | * | * | * | * | * | * | * | * | * | -1 | * | -2 |
| Total | * | * | * | 1 | 1 | 2 | 3 | 4 | 6 | 8 | 10 | 5 | 35 |
| Change in Deficit or Surplus^a | -1 | -3 | -6 | -10 | -14 | -18 | -23 | -29 | -37 | -44 | -52 | -51 | -236 |
| Interest Rates Are 1 Percentage Point Higher per Year | | | | | | | | | | | | | |
| Change in Revenues | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Change in Outlays | | | | | | | | | | | | | |
| Higher rates | 11 | 26 | 33 | 38 | 42 | 47 | 50 | 52 | 54 | 54 | 54 | 186 | 450 |
| Debt service | * | 1 | 3 | 5 | 8 | 11 | 14 | 18 | 23 | 27 | 32 | 27 | 142 |
| Total | 11 | 26 | 36 | 43 | 50 | 58 | 64 | 70 | 76 | 81 | 86 | 213 | 592 |
| Change in Deficit or Surplus^a | -11 | -26 | -36 | -43 | -50 | -58 | -64 | -70 | -76 | -81 | -86 | -213 | -592 |
| Inflation Is 1 Percentage Point Higher per Year | | | | | | | | | | | | | |
| Change in Revenues | 11 | 35 | 63 | 93 | 126 | 165 | 206 | 248 | 304 | 361 | 425 | 481 | 2,025 |
| Change in Outlays | | | | | | | | | | | | | |
| Higher rates | 11 | 26 | 35 | 40 | 45 | 50 | 53 | 56 | 58 | 59 | 60 | 195 | 482 |
| Debt service | * | * | 1 | 1 | 2 | 2 | 2 | 2 | 1 | -1 | -4 | 6 | 6 |
| Discretionary spending | 0 | 5 | 13 | 22 | 32 | 43 | 55 | 67 | 80 | 93 | 107 | 116 | 517 |
| Mandatory spending | 1 | 11 | 24 | 38 | 55 | 73 | 93 | 117 | 141 | 171 | 204 | 200 | 925 |
| Total | 12 | 43 | 72 | 102 | 134 | 168 | 203 | 241 | 279 | 322 | 367 | 518 | 1,931 |
| Change in Deficit or Surplus^a | * | -7 | -9 | -9 | -8 | -3 | 3 | 7 | 24 | 39 | 58 | -36 | 95 |

Source: Congressional Budget Office.

Note: * = between -\$500 million and \$500 million.

a. Negative amounts indicate an increase in the deficit or a reduction in the surplus.

from 2005 through 2014—and increase outlays by \$1.9 trillion (or about 6 percent) over that same period (*see Table B-1*). In the short run, the net effect is higher deficits—as increases in outlays exceed increases in revenues (in large part because of the impact on interest payments). But by 2010, the revenue increases associated with higher inflation pick up and surpass the increases in

outlays. Including debt-service costs, the net effect of this scenario is a reduction in cumulative deficits of \$95 billion over the 2005-2014 period.

This rule of thumb roughly corresponds to—but is in the opposite direction of—the economic changes to the baseline described in Chapter 1. Changes to projections of

revenues and outlays since CBO's previous baseline reflect updated projections for a variety of other economic variables as well as inflation, so the rule of thumb for inflation is not directly comparable to the baseline results. Also, the pattern of lower inflation (as measured by the consumer price index) for the baseline projections is not smooth across the 10-year period² as it is in the rule-of-thumb estimate for inflation, which leads to differences between the baseline changes and the totals implied by the rule of thumb. Furthermore, other measures of inflation—such as the GDP deflator—affect baseline projec-

tions and exhibit different patterns of change across the baseline period. Nevertheless, both the baseline and the rule-of-thumb calculations indicate that the effects of inflation are slightly stronger on the revenue side of the budget, but are mostly offset by the effect on outlays.

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2. Compared with CBO's August 2003 projections of the annual increase in the consumer price index, its current projections are lower by 0.7 percentage points in 2005, 0.5 percentage points in 2006, and about 0.3 percentage points each year from 2007 through 2014.